

## CLAIMS

1. A method for producing a fine metal powder, characterized by comprising the steps of:

5       subjecting a solution containing tetravalent titanium ions and having a pH of not more than 7 to cathode electrolytic treatment to reduce parts of the tetravalent titanium ions to trivalent titanium ions, to obtain a reducing agent solution  
10       containing both the trivalent titanium ions and the tetravalent titanium ions; and

      adding a water-soluble compound of at least one type of metal element forming the fine metal powder to the reducing agent solution, followed  
15       by mixing, to reduce and deposit ions of the metal element by the reducing action at the time of oxidation of the trivalent titanium ions to the tetravalent titanium ions, to obtain the fine metal powder.

20       2. The method for producing a fine metal powder according to claim 1, characterized in that as the solution containing the tetravalent titanium ions forming the reducing agent solution, a solution containing chlorine ions  
25       having a molar ratio which is not less than four

times that of the tetravalent titanium ions is used.

3. The method for producing a fine metal powder according to claim 2, characterized in that  
5 a hydrochloric acid solution of titanium tetrachloride is used as the solution containing the tetravalent titanium ions.

4. The method for producing a fine metal powder according to claim 1, characterized in that  
10 at least one type selected from a group consisting of Ag, Au, Bi, Co, Cu, Fe, In, Ir, Mn, Mo, Ni, Pb, Pd, Pt, Re, Rh, Sn and Zn is used as the metal element forming the fine metal powder.

5. The method for producing a fine metal  
15 powder according to claim 1, characterized in that fine metal powders having an average particle diameter of not more than 400 nm are produced.

6. The method for producing a fine metal powder according to claim 1, characterized in that  
20 the solution containing the tetravalent titanium ions after the deposition of the fine metal powder is reproduced as the reducing agent solution by the cathode electrolytic treatment, and is repeatedly used for producing the fine metal  
25 powder.